

CLAIMS

1. A method of making a scuff resistant engine cylinder liner, said method comprising the steps of:

providing a coolant jacketed cast iron cylinder liner body defining a generally cylindrical interior wall with a plurality of radially extending
5 ports through said wall and spaced annularly therearound to form a port area intermediate opposite ends of said wall;

machining said liner body, including the inner surface of said wall, to form approximately cylindrical upper and lower bore portions respectively above and below said port area and an annular band between the
10 bore portions and extending slightly above and below said port area, the annular band including the port area machined with slightly greater inner diameter than that of said upper and lower bore portions and upper and lower port relief areas blending said port area with said upper and lower bore portions;

15 case hardening the upper bore and at least one portion of the blended port relief areas through induction heating to hardening temperature of said upper bore and the blended port relief areas and subsequent ambient cooling such that a scuff resistant hardened surface is provided in said upper bore area and said at least one portion of the blended port relief areas; and

20 case hardening at least the port area through laser heating of the port area and subsequent ambient cooling such that a scuff resistant hardened surface is provided in said port area.

2. A method as in claim 1 including traversing the laser beam across the port area in a overlapping helical pattern to ensure the formation of a fully hardened surface in the port area.

3. A method as in claim 2 including extending laser hardening into the port relief areas immediately adjacent the intake port area to ensure continuous hardening of the port area and the adjacent relief portions.

4. A method as in claim 1 wherein the upper bore portion and the upper and lower relief areas are induction hardened and the port area is laser hardened.

5. A method as in claim 1 wherein the upper bore portion and the upper and lower relief areas are induction hardened and the port area and the upper and lower relief areas are laser hardened.

6. A method as in claim 1 wherein the upper bore portion and the upper relief area are induction hardened and the port area is laser hardened.